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(54) RALLY GAME SYSTEM USING VIEW LABEL

(57)Abstract:

PROBLEM TO BE SOLVED: To present computer-derived topographic information and an image showing real view to each user while matching the topographic information with each part of the image and to make an automobile rally game possible in a real city.

SOLUTION: This system transmits position information (with time) about the automobiles of users and automobile information from a terminal 10 to a center 20 at regular time intervals. A game information control part 25 controls the position information about each automobile and the automobile information, and delivers the position information about the users and order information to a label information originating part 22. The label information originating part 22 originates rally order label information such that rally order information corresponds to an automobile area in an

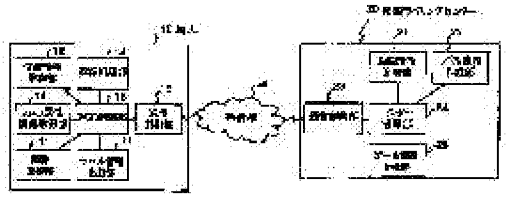

image of the view. The rally order label information is delivered to the label information output part 17 of the terminal 10 and displayed on the windshield of the automobile of each user.

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention carries out the superimposed display of the geographical information about each subregion in the picture to an image display device to the picture which the user photoed using landscape image input devices, such as a camera, or relates to the device which carries out an audio assist etc. and is taught to a user.
[0002]
[Description of the Prior Art]Conventionally, there were various navigation systems as a system which teaches a user the geographical information about the circumference in which a user is present.
[0003]Drawing 12 is a lineblock diagram of the navigation device indicated by JP,8-273000,A. The position updating part 71 which will update the position of vehicles with reference to road map data if this device inputs the position data and motion data of vehicles, The data generating part 72 for a display which generates the road data for a display, and the background data for a display based on map data etc., The three-dimensional dynamic-image-data preparing part 73 which creates three-dimensional dynamic image data based on these data for a display, It has the storage parts store 74, and when the user of a navigation device sets up a priori a running path including the destination and a course place, it has a function in which a course can be set up, looking at the real cine mode display screen along the road which actually exists instead of a map screen.
[0004]According to this device, the user can see the cine mode display (for example, drawing 13) in alignment with that course, when running in accordance with the course which actually exists.
[0005]
[Problem(s) to be Solved by the Invention]However, when using the device, and human being

matches actual scenery and the geographical information in the world of a computer eventually with the naked eye, it must be recognized what the thing in actual scenery is. That is, based on the sign in the map with which the cine mode display of what the actual building and road in a user's view, and a mountain are was carried out, etc., a naked eye is made reliance, human being's brain is used unconsciously, and human being has to work matching and has to understand. If the map in a computer and the actual scene were compared in the street corner, the direction has been grasped, or the mark was found and it gazed at the direction, after understanding the feature of the building which exists in the direction, the map was seen again, and he understands what the building is.

[0006]For this reason, the time and effort which compares the map and real landscape on a computer repeatedly, and is matched at human beings has the problem of not being omissible. A real landscape is hard to see and cannot take correspondence easily especially in semidarkness, the night, etc.

[0007]There is a fault that the automobile rally game in the inside of a personal computer has few senses of reality, and they are unsatisfactory.

[0008]The purpose of this invention is to provide the scene label use type rally game system which can do a rally game in the actual street while matching each portion in the geographical information on a computer, and the picture (it is hereafter called a landscape image.) of a real landscape and teaching a user.

[0009]

[Means for Solving the Problem]This invention creates map data on a computer beforehand as three-dimensional data, A position in case a picture (it is henceforth called a landscape image in order to distinguish from a CG image) is inputted, an angle of a camera, a focal distance, and image size are acquired at the time of photography, Computer graphics at the time of viewing from a position at the time of real landscape photography, an angle of a camera, and a focal distance in three-dimensional map space on a computer. (It is hereafter referred to as CG.) Geographical information within a picture is acquired and matching is realized by carrying out the superimposed display of the geographical information to a landscape image which is a real landscape. This geographical information is names, such as a structure, or attribution information of those in a picture, and attribution information means information about all attributes (for example, an outline, a color, etc.) about that structure. Suppose that the word "structure" is used in the sense of all data that has a certain geographical structures in the map DB also including natural geographical features, such as a mountain, a river, and the sea, in addition to an artificial structure in this specification. In acquisition of geographical information, it asks for a landscape image based on a camera position, a camera angle, a focal distance, and image size, and asks for a structure of a multiple image. A position (a grant position is called hereafter) of a landscape image in which the structure should be reflected is searched

for, and the superimposed display of a name or attribution information of a structure is carried out.

[0010]In order to raise further accuracy of matching with a structure in a landscape image, and a structure in a CG image, a structure previously gained to each subregion of a landscape image is matched with pattern matching. A CG image is created based on a gained structure, and it asks for a structure which matched subregion in a CG image with pattern matching to said subregion of a landscape image, and became a basis of matched subregion.

[0011]Here, an example of a method of creating a CG image is described. The three-dimensional map DB is accessed based on a camera position, a camera angle, a focal distance, and image size which were acquired previously, and it asks for view space in three-dimensional map space. It asks for a structure in view space, and three-dimensional projection conversion of the solid data of each structure is carried out to this surface of projection by using a camera screen as a surface of projection. It hides in other structures among line data which furthermore constitutes a projection form of each structure, and the hidden line removal of the hidden-line data is carried out using techniques, such as a normal vector method. A hidden line removal is carried out and area division of the CG image is carried out based on the remaining line data. Since the three-dimensional map DB is used, a name of a structure which serves as a basis of the field for every field can be matched.

[0012]Then, a structure name of subregion of a CG image matched with each subregion of a landscape image by pattern matching is extracted. Three-dimensional projection conversion of the position coordinate of a structure in inside of three-dimensional map space is carried out to a previous surface of projection, and a position coordinate of a real landscape picture which should superimpose an extracted structure name is searched for. Label information is created from a position coordinate of a real landscape picture which should superimpose an extracted structure name. A structure name is superimposed on a landscape image which is a real landscape based on label information, and it displays on vision apparatus.

[0013]In this invention, in order to make an automobile rally game in the still more nearly actual street, the following composition is taken.

[0014]A communication control means sends position information (with time) and car information about a user to a center for every fixed time from a terminal. Here, having called it car information consists of attribution information (for example, a registration number of a car, the vehicle name / model / color of a car, using frequency of a transceiver of automobile loading, etc.) about a car which each user drives. A communication control means by the side of a center passes position information and car information about a user to a game information management tool via a center control means. In a game information management tool, each user's position information and car information are managed, precedence information in a rally of each car computed from position information about a car which a user who participates in a

game drives, and position information and map information is managed, and position information and precedence information are passed to a center control means. In a center control means, car information is passed to a user's position information and a precedence information pan at a label information preparing means. In a label information preparing means, based on a user's position information and car information under intervention, When a car which exists in a landscape image is recognized and a registration number of the car has been recognized from a number plate of the car, If it can presume that the registration number is a registration number of a car which a certain user drives from a point of position information and car information, rally ranking label information which made precedence information of a rally correspond to a field of a car in a landscape image will be created, and, in addition to the usual label information, a center control means will be passed. Here, it becomes rally ranking label information from attribution information including a name of an automobile slack structure which a user under intervention operates, and precedence information, and its position information. Via a communication control part, over a label information outputting part, rally ranking label information superimposes a ranking number on a picture of a car, and is displayed on a windshield of a user's car.

[0015]A scene label use type rally game system of this invention, Consist of two or more terminals and centers which were carried in a car, respectively, and said each terminal, An image acquiring means which acquires a picture, and a position information acquiring means which acquires a camera position at the time of image acquisition, A camera attribution information acquisition means which acquires a camera angle, a focal distance, and image size at the time of image acquisition, An image processing means which divides an acquired picture into two or more subregions, and information about area division, said camera position, said camera angle, said focal distance and said image size of said picture via a communications network, A communication control means which transmits to a center, transmits to a center car information which is position information with time on a car of the terminal concerned, and the attribution information of a car via a communications network for every fixed time, and receives label information and rally ranking label information from said center, A name of a structure in said label information or its attribution information is superimposed on a position corresponding to a grant position in a picture, Have a label information output means which displays a picture on which it was superimposed on vision apparatus, and displays said rally ranking label information on a windshield of a car, and a terminal-control means to control said each means, and said center, Information about area division of said picture, said camera position, said camera angle, said focal distance, said image size, position information with time on each terminal, and car information are received from said each terminal via said communications network, A communication control means which transmits said label information and said rally ranking label information to said terminal,

A map information management tool which gains a structure which manages map information, asks for view space in map information space based on a camera position, a camera angle, a focal distance, and image size which were received, and exists all over the view space, A game information management tool which manages position information with time and car information of each terminal, and manages precedence information in a rally of each car which a user who participates in an automobile rally game drives, Said label information which matches said gained structure to said subregion of said picture, and includes a name or attribution information, and a grant position of said structure which were matched is created, Based on a user's position information and car information under rally game intervention, When a registration number of the car has been recognized from a number plate of the car and the registration number can presume a car which exists in a landscape image to be a registration number of a car which a certain user drives from a point of position information and car information, It has a label information preparing means which creates rally ranking label information which made precedence information of a rally game correspond to a field of a car in a landscape image, and a center control means which controls said each means.

[0016]According to the embodiment of this invention, a label information preparing means, A CG image which is a computer graphics image is created based on a gained structure, Subregion in said CG image is matched with pattern matching to said subregion of said picture, it asks for a structure of matched subregion, and label information including a name or attribution information, and a grant position of the structure is created.

[0017]According to other embodiments of this invention, a label information preparing means, Carry out three-dimensional projection conversion of the gained structure to a camera screen, eliminate a structure which does not appear from a viewpoint, and a CG image is created, A border line of subregion in a CG image divides a CG image into subregion, It asks for a structure which matched said subregion of said picture, and said subregion of said CG image with pattern matching, matched to subregion of a picture, and became a basis of subregion of a CG image, and label information including a name or attribution information, and a grant position of the structure is created.

[0018]

[Embodiment of the Invention]Next, the embodiment of this invention is described with reference to drawings.

[0019]Reference of drawing 1 will constitute the scene label use type rally game system of one embodiment of this invention from the terminal 10, the center 20, and the communications network 30 which were carried in the car. Here, two or more terminals 10 exist actually, although the deer graphic display even of the **** top is not carried out.

[0020]The position information acquisition part 12 which acquires the image acquiring part 11 from which the terminal 10 acquires a picture, and the camera position at the time of image

acquisition, and the camera attribution information acquisition part 13 which acquires the camera angle, the focal distance, and image size at the time of image acquisition, The image processing portion 14 which divides the acquired picture into two or more subregions, and the information and camera position about area division, the camera angle, the focal distance and image size of said picture are transmitted to the center 20 via a communications network, the attribution information (the registration number of a car.) about the position information with time on a car and the car 10 of the terminal 10 The car information which consists of using frequency of the transceiver of a vehicle name / model / color, and automobile loading, etc. is transmitted to the center 20 via the communications network 30 for every fixed time, The communication control part 15 which receives label information and rally ranking label information from the center 20, The label information outputting part 17 which superimposes the name of the structure in label information, or its attribution information on the position corresponding to the grant position in a picture, and displays the picture on which it was superimposed on vision apparatus, and displays rally ranking label information on the windshield of a car, It comprises the terminal control section 16 which controls each part 11-15, and 17.

[0021]The center 20 receives the information and camera position about the area division of a picture, a camera angle, a focal distance, image size, the position information with time on each terminal, and car information from each terminal 10 via the communications network 30, The communication control part 23 which transmits label information and rally ranking label information to the terminal 10, The map information Management Department 21 which gains the structure which manages map information, asks for view space in map information space based on the camera position, the camera angle, the focal distance, and image size which were received, and exists all over the view space, The game information Management Department 25 which manages the position information with time and car information of each terminal 10, and manages the precedence information in the rally of each car which the user who participates in an automobile rally game drives, The label information which matches the structure gained to the subregion of said picture, and includes the name or the attribution information, and the grant position of a structure which were matched is created, Based on a user's position information and car information under rally game intervention, When the registration number of the car has been recognized from the number plate of the car and the registration number can presume the car which exists in a landscape image to be a registration number of the car which a certain user drives from a point of position information and car information, It comprises the label information preparing part 22 which creates the rally ranking label information which made the precedence information of the rally game superimpose on the field of the car in a landscape image, and the center control section 24 which controls each part 21-23, and 25.

[0022]Next, operation of this embodiment is explained with reference to the flow chart of drawing 2.

[0023]First, in order that the terminal control section 16 may acquire the information about a landscape image, a processing start command is sent to the position information acquisition part 12, the camera attribution information acquisition part 13, and the image acquiring part 11. The position information acquisition part 12 collects position information per second by a GPS receiver etc. in response to a command from the terminal control section 16, and passes it to the terminal control section 16 (Step 21). Here, a time interval is good not only for how [a second bit but]. The camera attribution information acquisition part 13 acquires the camera angle of landscape image recorders, such as a camera at the time of picture photography, in the group of a horizontal angle and an ascending vertical angle in response to the command of the terminal control section 16 (Step 22), and if it is a landscape image device which has a zoom function simultaneously, it will acquire a focal distance (Step 23). The image acquiring part 11 acquires a landscape image per second from the terminal control section 16 in response to a command, and passes it to the control section 16 (Step 24). Since image size is immobilization for every landscape image device, the terminal control section 16 holds image size information. The terminal control section 16 holds the collected information as a landscape image file.

[0024]Drawing 3 shows the file format of the data structure of a landscape image file. A landscape image file has header information and image data. As header information, it has position information, camera angle information, a focal distance, time information, the image size of a graphics file, a type, and size. As position information, it has each data (for example, east longitude 137-degree 55 minutes and 10 seconds, north latitude 34-degree 30 seconds of 34 minutes, altitude of 101 m 33 cm, etc.) of the east longitude, the north latitude, and altitude. As a camera angle, it has each data (for example, 254 horizontal-angle right-handed rotations, 15 ascending vertical angles, etc.) of a horizontal angle and an ascending vertical angle. Focal distance data is the focal distances (for example, 28 mm etc.) of the camera lens at the time of picture photography. As time information, it has the time at the time of photography (for example, Japan Standard Time 15:06 17 etc. seconds etc. on January 31, 1997). As image size of a graphics file, it has pixel size (for example, 640x480 grade) in every direction. Similarly it has file types (TIFE form, an 8-bit color, etc.). Similarly it has the numbers of bytes (307.2 KB etc.) of a file. It has the image data itself in a binary format.

[0025]If the terminal control section 16 stores a landscape image file, to the image processing portion 14, it will extract a border line from a landscape image, and will order to divide a landscape image into two or more fields. In the image processing portion 14, if it says roughly, a differential process will be performed based on the density difference in a landscape image, a border line will be extracted (Step 25), and area division is carried out by performing labeling

bordering on the border line (Step 26). The technical term called labeling used here is a technical term used in the area division of a picture. As a procedure, a picture is first changed into monochrome shade image. Since an outline is a portion into which a luminosity changes suddenly, a border line is extracted by performing a differential process and asking for a portion with a larger differential value than a threshold. At this time, the line width of a border line is 1 pixel, and the border line is connected. Therefore, thinning is performed and the connected line with a line width of 1 pixel is obtained. A differential process and thinning are enough here, if a certain technique is used from the former.

[0026]The obtained border line is considered to be a border line of a field, and operation of numbering the field constituted by a border line is performed. The maximum number in the number turns into the number of fields, and the pixel number in a field expresses the area of the field. The example which divided the landscape image into two or more subregions is shown in drawing 8. The measure of the similarity (nearness) between fields may be introduced and clustering processing which summarizes two or more fields in which character is alike to one field may be performed. It is good also by the clustering method like the existing method throat.

[0027]If area division processing of a landscape image is completed, the communication control part 15 will transmit the information (header information of a landscape image file) about the area division of the acquired camera position, a camera angle, a focal distance, image size, and a picture to the center 20 with directions of the terminal control section 16 (Step 27). These information is passed to the map information Management Department 21 of the center 20 through the communication control part 23 and the center control section 24, and the map information Management Department 21 accesses the map DB, and performs calculation processing of view space (Step 28). There is a map database program as an example of the map information Management Department 21. The map information Management Department 21 has managed three-dimensional map data. Although two-dimensional map data may be sufficient, since there is no height information in that case, the accuracy of the grant position of the labeling to a real landscape is inferior. Height information is compensated and processed when carrying out based on two-dimensional map data. For example, if there is number-of-stories information as which a house expresses several stories when it is two dimensional data of a house, three-dimensional data will be created based on the height information which multiplied the number of stories by fixed numbers, presumed the height of the house, was presumed to be two dimensional data, and was searched for. Even when there is no number-of-stories information, height information can be presumed by assigning a fixed number of height according to the area of a house figure, and three-dimensional data is similarly created based on presumed height information. In this way, three-dimensional data is created and processing is advanced.

[0028]The example of three-dimensional map data is shown in drawing 4. The map information space expressed by two dimensions is shown in drawing 4 (1), and the map information space expressed by the three dimension is shown in drawing 4 (2). In response to the command of the center control section 24, view space is computed based on the header information of a landscape image file to this three-dimensional map information space at the map information Management Department 21 (Step 28). The example computation of view space is shown in drawing 5. First, XY axis shall stretch horizontally and the Z-axis shall stretch perpendicularly. From the position information in the header information of a landscape image file, the position of the viewpoint E is set up in three-dimensional map information space. For example, if it is east longitude 137-degree 55 minutes and 19 seconds, and north latitude 34-degree 30 seconds of 34 minutes and the altitude of 101 m 33 cm, the corresponding coordinates in the map mesh number corresponding to it will be set up. Similarly a camera angular direction is set up based on the horizontal angle and ascending vertical angle in the camera angle information in header information. The focus F is taken at the point which progressed by the focal distance from the viewpoint E on the straight line showing a camera angular direction. A sight line direction vector is a unit vector of the length 1 which comes out from the viewpoint E on the straight line. The width x in the X-axis of a camera screen is set up from lateral size with the image size of a landscape image file, and the width y in a Y-axis is set up from the size of a lengthwise direction. To a sight line direction vector, the flat surface of the horizontal x length y is vertical to a camera angular direction, and it is set up so that the focus F may be included. It asks for the straight line which connects the point of four corners of a camera screen from the coordinates of the viewpoint E respectively, and let three-dimensional space which four half lines prolonged from the viewpoint E make be view space. The example of the view space in three-dimensional map space is shown in drawing 6. It looks at three-dimensional map space from XZ flat surface. The portion surrounded with the slash in drawing 6 is a sectional view in XZ flat surface of the space belonging to view space. The building and mountain in view space are contained in the example of drawing 6.

[0029]It asks for the structure which exists in the view space for which it asked at the map information Management Department 21. Each peak which constitutes the solid showing a structure calculates whether it exists in the interior area of view space for every structure. Usually, two-dimensional map space is divided in the two-dimensional mesh of certain size. In addition to the mesh of the direction of two dimensions in every direction, as how to cut the mesh of three-dimensional map space, a mesh is cut with the constant interval also to the height direction. Space will be divided in the unit space of a rectangular parallelepiped. First, the existence of a lapped part with view space is investigated the whole unit space of a rectangular parallelepiped, and the number of three-dimensional unit map space with a lapped part is searched for. The number of three-dimensional unit map space here is the same as that

what is called of a mesh number. The existence of view space and a lapped part is investigated to the structure in three-dimensional unit map space with a lap. It asks for the straight line which connects the coordinates of the peak and the coordinates of a viewpoint which constitute a structure, and if the straight line has an intersection to the camera screen of drawing 7, it is in view space. If at least the one peak fulfills this condition among two or more peaks which constitute a structure, that structure shall have view space and a lapped part.

[0030]When a structure is contained in the inside of view space or that part is included, the processing which carries out three-dimensional projection conversion of each structure to this surface of projection is started by using a camera screen as a surface of projection (Step 29). Here, as shown in drawing 7, after reexpressing the point P by the coordinate system based on the viewpoint E based on a following formula (1), the point P is projected on a camera screen and it asks for the intersection Q.

[0031]

[Equation 1]

$$\begin{pmatrix} x' \\ y' \\ z' \end{pmatrix} = \begin{pmatrix} \frac{-l_y}{r} & \frac{l_x}{r} & 0 \\ -\frac{l_x\, l_z}{r} & -\frac{l_y\, l_z}{r} & r \\ l_x & l_y & l_z \end{pmatrix} \begin{pmatrix} x - e_x + l_x t \\ y - e_y + l_y t \\ z - e_z + l_z t \end{pmatrix}$$

$$\begin{pmatrix} X \\ Y \end{pmatrix} = \begin{pmatrix} \frac{t}{t-z'} \\ \frac{t}{t-z'} \end{pmatrix} \begin{pmatrix} x' \\ y' \end{pmatrix}$$

Coordinate-vectors L= of the coordinate-point E=(ex, ey, ez):viewpoint of the peak which constitutes a point P=(x, y, z):structure here (lx, ly, lz): Sight line direction vector (unit vector) Coordinates $r=(lx^2+ly^2)^{1/2}$ intersection Q= at the time of expressing by the coordinate system based on the viewpoint E of the point P'=(x', y', z'):point P (X, Y): The projected point t to the camera screen of the point P is a focal distance. [0032]In three-dimensional projection conversion, the field which the peak stretches for every structure first is searched for. For example, six fields can be found if it is a structure expressed in a rectangular parallelepiped. When carrying out projection conversion of each field to a camera screen, to each pixel on the camera screen included in a projection area, the distance of a viewpoint and the corresponding points on the field is calculated, and it stores in a memory as a depth value (Z value). For every field of each structure, the depth value (Z value) over each pixel on a camera screen is calculated, and it stores in a memory. z' in one expresses the depth value (Z value) from a viewpoint (formula).

[0033]There are a structure which appears from a viewpoint, and a structure not appearing in inside of a structure by which three-dimensional projection conversion was carried out to a

camera screen. It is necessary to ask only for a structure which appears from a viewpoint in it, and to search for a field located from a viewpoint in an opposite hand, and a field interrupted by other structures. Then, hidden surface elimination is performed (Step 30). Although it is in a method of hidden surface processing variously, a Z buffer algorithm is used, for example. Other scanline algorithms and the ray tracing method may be sufficient.

[0034]A field which takes a pixel on a camera screen arbitrarily and takes the smallest depth value to the pixel is searched for. Thus, if sequential operation is continued about each field of each structure, a field nearest to a viewpoint will be left behind for every pixel on a camera screen. Since a camera screen top pixel in which a field nearest to a viewpoint is determined for every pixel on a camera screen, and a field nearest to a viewpoint is common generally constitutes a field, in a camera screen, two or more fields which consist of a pixel which makes a common field the nearest field are made. In this way, a field which was able to be found is a field of a result of having carried out three-dimensional projection conversion of the subregion of a structure which appears from a viewpoint. A field in an opposite hand and a field interrupted by other structures are eliminated from a viewpoint.

[0035]In this way, a made field forms a CG picture area (Step 31).

[0036]To apex coordinates of a two-dimensional figure which constitutes a CG picture area, three-dimensional coordinates before projection conversion are searched for, and it stores in a memory by making both correspondence relation into link information. It is used for asking etc. of which structure the two-dimensional field is a projection based on link information.

[0037]A hidden line removal is carried out and area division of the CG image is carried out based on the remaining line data. Since the three-dimensional map DB is used, a name of a structure which serves as a basis of the field for every field can be matched. A field to which a CG image was divided is numbered in order. An example which divided a CG image into two or more subregions is shown in drawing 9.

[0038]If area division processing of a CG image is completed, the center control section 24 will order to the label information preparing part 22 to match a region division of a CG image, and a region division of a landscape image. In the label information preparing part 22, a region division of a CG image and a region division of a landscape image are matched by template matching (refer to Step 32 and drawing 10).

[0039]It matches with a region division of a CG image sequentially from a young field (for example, No. 1) of a number among region divisions of a landscape image. In matching, although it is very good in which [of the former to a certain MACHINGU methods], the simple template-matching method is taken here. That is, when you pile up two fields to compare and there is a ratio of an overlapping portion more than a fixed ratio fixed as a threshold, suppose that it matches as a field about the same structure. For example, a coordinate value of each pixel in the field is set to (A, B) about R1 of the 1st region division of a landscape image.

Values of a pixel in coordinates (A, B) are an inside of a field, therefore 1. In the 1st region division S1 of a CG image, if coordinates (A, B) become in the field S1, it will be the pixel value 1 and will lap, but if it becomes outside S1, it will be the pixel value 0 and will not lap. In this way, as the lap coefficient K (A, B) in coordinates (A, B), 1 and when lapping, and not lapping, it is decided by 0. Coordinates (A, B) are moved in the field R1, and the lap coefficient K (A, B) is calculated. And to several N1 of coordinates (A, B) moved in the field R1, the lap coefficient K (A, B) calculates several N2 of coordinates which were 1, and a thing corresponding to a case where N1/N2 are more than a threshold, in the region division R1 of a landscape image and the region division S1 of a CG image is decided on. This matching is performed from the 1st of a region division of a landscape image to the last thing. Even if a position gap of some is in an XY direction in addition to this as a matching method, a valuation function which becomes the same value may be used.

[0040]After matching subregion of a CG image to subregion of a landscape image in the label information preparing part 22, It is matched, a structure of subregion is extracted (Step 33), and processing (Step 34) which searches for information (a name or attribution information of a structure) which should be further superimposed for every subregion of a landscape image, and is created as label information with a position which should be superimposed is started. First, subregion of a corresponding CG image is taken out to subregion of a landscape image. Subregion of a taken-out CG image is obtained by carrying out three-dimensional projection conversion of the field which has a three-dimensional structure thing in three-dimensional map space from the first to a camera screen. Then, a depth value (Z value) in which subregion of a CG image has a field of a three-dimensional structure thing used as a basis of three-dimensional projection conversion is calculated as a key. When three-dimensional projection conversion is carried out previously, created link information may be used as a key. Based on a field of a structure used as a basis, the three-dimensional map DB is accessed and a name or attribution information of the structure is acquired. It is [anything] good if attribution information is information which means information which accompanies about the structure and starts the structure here. And a position coordinate which should superimpose a name or attribution information is decided to subregion of a landscape image. How to determine may determine how. For example, the center of figure which stretches subregion may be sufficient. Label information is created from a name or attribution information, and a grant position coordinate of the structure. An example of label information is shown in Table 1.

[0041]

[Table 1]

構造物名称	重畳位置	フォントサイズ
富士山	（３００，５００）	１０
Ａビル	（４５０，２５０）	１０
Ｂビル	（１５０，２００）	１２

The label information preparing part 22 will pass label information to the center control section 24, if it finishes creating label information. The center control section 24 will order to transmit label information to the terminal 10 to the communications control 23, if label information is received. (Step 35).

[0042]Label information is passed to the label information outputting part 17 of the terminal 10, and the label information outputting part 17 superimposes a name or attribution information of a structure in label information on a position in a landscape image (Step 36), A landscape image on which it was superimposed is displayed on graphic display devices, such as a display (CRT) and a head MARAN toddy spray (Step 37). An example of a landscape image in which it was superimposed on label information is shown in drawing 11.

[0043]If an automobile rally game is started between a user of the terminal 10, and a user of other terminals, the communication control part 15 will send position information with time and car information of a car which a user of the terminal 10 operates to the center 20 for every fixed time with position information with time on the terminal 10 (Step 38). Through the center control section 24, position information with time and car information of a car of the terminal 10 are passed to the game information Management Department 25 of the center 20, and the game information Management Department 25, Each user's position information with time and car information are managed, precedence information in a rally of each car which a user who participates in an automobile rally game drives is managed, and a user's position information and car information are passed to the center control section 24 (Step 39). A user's position information and car information are passed to the label information preparing part 22 by the center control section 24, and in the label information preparing part 22. When a registration number of the car has been recognized from a number plate of the car, a car which exists in a landscape image based on a user's position information and car information under rally game intervention, If the registration number can presume a registration number of a car which a certain user drives from a point of position information and car information, rally ranking label information on which a field of a car in a landscape image was made to superimpose precedence information of a rally game will be created, and the center control section 24 will be passed (Step 40).

[0044]The center control section 24 transmits rally ranking label information to the terminal 10 (Step 41). The label information outputting part 17 of the terminal 10 displays rally ranking label information on the windshield of a car (Step 42).

[0045]

[Effect of the Invention]Since according to this invention the geographical information on a computer and each portion in the landscape image of a real landscape can be matched and a user can be shown, as explained above, Human being compares the map and real landscape on a computer, and it does not match at human beings, ** also ends, and an automobile rally game is made in the actual street, and the existence and ranking understand only a rally participating vehicle in a national highway etc.

[Translation done.]